

IN THE DISTRICT COURT OF OKLAHOMA COUNTY
STATE OF OKLAHOMA

Jean Bookout; Charles Schwarz,
individually and as Personal
Representative of the Estate of
Barbara Schwarz, deceased;
Richard Forrester Brandt, as
Personal Representative of the
Estate of Barbara Schwarz,
deceased,

Plaintiffs,

vs.

Toyota Motor Corporation; Toyota
Motor Sales, U.S.A., Inc.;
Toyota Motor Engineering and
Manufacturing North America,
Inc.; Aisan Industry Co., Ltd.,

Defendants.

Case No. CJ-2008-7969

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TRANSCRIPT OF MORNING TRIAL PROCEEDINGS

HAD ON THE 23RD DAY OF OCTOBER, 2013

BEFORE THE HONORABLE PATRICIA G. PARRISH,

DISTRICT JUDGE

Reported by: Karen Twyford, RPR

***** THIS TRANSCRIPT HAS NOT BEEN PROOFREAD *****

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1 (Whereupon, the following morning trial proceedings
2 were had on the 23rd day of October, 2013, to wit:)

3 THE COURT: Goods morning. We're back on the
4 record. The members of the jury are present as well as
5 counsel and their clients.

6 Mr. Bibb, you can call your next witness.

7 MR. BIBB: Thank you very much, your Honor. We
8 call Dr. Thomas Livernois.

9 THE COURT: Raise your right hand, please.

10 (Witness sworn.)

11 THOMAS LIVERNOIS,
12 called as a witness, after having been first duly sworn,
13 testified as follows:

14 DIRECT EXAMINATION

15 BY MR. BIBB:

16 Q Dr. Livernois, you been sworn in now.

17 A I have. Yes.

18 Q And would you please tell the jury who you are and
19 where you're from.

20 A My name is Tom Livernois. I'm from Michigan.

21 Q What kind of occupation do you have, Dr. Livernois?

22 A I'm an engineer, I do technical consulting, and I
23 also participate in industry committees as well.

24 Q Dr. Livernois, how long you been a consulting
25 engineer?

1 A Since 2003, so that would be just over 11 years.

2 Q Tell the jury just a little bit about your
3 educational background.

4 A Sure. In 1984, I graduated from Michigan
5 Technological University with a degree in electrical
6 engineering. Then in 1986, I received a master's degree in
7 electrical engineering from Michigan State University. Then
8 in 1991, I received a doctorate degree in electrical
9 engineering from the University of Michigan.

10 Q Are you a registered professional engineer?

11 A I am. Yes.

12 Q Which state?

13 A In the state of Michigan, and in the state of
14 Arkansas.

15 Q Is your specialty electrical engineering?

16 A It is electrical engineering. And then the PE exam
17 that I sat for dealt with the electronics and control
18 systems.

19 Q Okay. So with that background of a doctorate in
20 electrical engineering, you're specialties of electronics
21 and control systems, what sort of jobs you had since you got
22 out of school?

23 A When I graduated from the University of Michigan, I
24 took a position at Ford Motor Company in the electrical
25 distribution department. Then I did that for about a year

1 and a half. And then I had another assignment at Ford, the
2 second half of my tenure there, was in the advanced
3 electronic systems group.

4 Q So how long were you at Ford Motor Company?

5 A Approximately three years.

6 Q Then where did you go from there?

7 A After Ford Motor Company, I traveled a little bit,
8 but then I accepted a position at Chrysler at the, which was
9 in 1995.

10 Q What were you doing for Chrysler?

11 A There were two positions at Chrysler, the first dealt
12 with what call electrical and electronic systems
13 compatibility with itself and with its environment. And
14 that was in the scientific laboratories at Chrysler
15 Corporation.

16 Q What do you mean by capability?

17 A Well, for, electrical system to operate reliably and
18 perform the way it is supposed to in its intended
19 environment, you have to design it and validate it and test
20 it to make sure it will do that once it leaves the assembly
21 plant. So our lab, we dealt with electromagnetic
22 compatibility as well as other environmental situations. So
23 we looked at the electrical and electronic systems from an
24 EMI perspective.

25 Q Okay. And those are some terms that we will come

1 back to, electromagnetic compatibility. And EMI stands for
2 what?

3 A Electromagnetic interference.

4 Q While you were at Chrysler, did you do any work
5 on developing the electronic throttle control system used in
6 Chrysler motor vehicles?

7 A I did.

8 Q Tell the jury just briefly about that.

9 A Sure. I worked at Chrysler, then it was merged with
10 Daimler Benz, so it was Daimler Chrysler for the second half
11 of my tenure. And the 2004 -- sorry -- the 2003 pickup
12 truck, and I was working on the truck platform at the time,
13 they were introducing a 5.7 liter V-8 engine that had
14 electronic throttle control, and my group was involved in
15 helping establish what the environmental requirements were
16 for that system.

17 Q And Dr. Livernois, after 2000 did you leave Chrysler
18 and go to work for a supplier?

19 A That's correct. I did.

20 Q And AGC America, what kind of company is that?

21 A AGC America is a research and development subsidiary
22 of Asahi Glass Company.

23 Q What kind of work did you do for their?

24 A Well, Asahi Glass Company, by its nature, proceeds
25 windshields for automobiles. And probably some of you have

1 seen the FM antennas that are on the rear windows of some
2 cars. Well, that's the kind of thing that we worked on at
3 AGC America because in that time frame, ten years ago, there
4 weren't the number of wireless devices there are today. So
5 car companies were thinking about what sorts of devices will
6 be out there: satellite radio, cell phones, things of that
7 nature. So car companies were aware of the electromagnetic
8 environment back then, and they were trying to develop
9 products that could integrate into their vehicle to provide
10 a better vehicle.

11 Q After working for AGC America, did you go to work for
12 Exponent?

13 A I did. Yes.

14 Q And we heard about Exponent yesterday. How long were
15 you there?

16 A I was with Exponent from 2003 until early 2010.

17 Q Okay. Then where did you go?

18 A There is a company called Design Research
19 Engineering. It is a smaller company. And I joined that
20 company in January of 2010.

21 Q And what sort of work do you do at Design Research
22 Engineering?

23 A At a high level, it is similar to Exponent. We solve
24 technical problems for clients so they can understand what
25 did or did not happen in a particular instance.

1 Q Okay. Do you from time to time provide expert
2 witness testimony in court?

3 A Yes, I do.

4 Q Have you published anything?

5 A I've published papers. Yes.

6 Q Published papers on electronics and electromagnetic
7 compatibility and that sort of thing?

8 A I have presented on that and published papers on
9 that. That is correct.

10 Q Are you a member of the Society of Automotive
11 Engineers?

12 A Yes, I am.

13 Q Tell me about your involvement with the society.

14 A Well, currently I'm the chairperson of one SAE
15 committee dealing with odometers and speedometers. And I'm
16 also a general interest member on the fuel systems committee
17 and the heated seat committee. And that just means that I
18 get involved with the committee and tell them what I think
19 and listen to what the industry sort of has to say about
20 these systems.

21 Q Dr. Livernois, have you been to apply that background
22 that you have in electronics and electromagnetic
23 compatibility to this case?

24 A Yes, I have.

25 Q Can you tell the jury just a little bit about what

1 sort of things that -- what you were asked to do in this
2 case, and then I will ask you about how you went about doing
3 that.

4 A Okay. I was asked in this case to look at the
5 subject vehicle, review the background of the case, and try
6 to determine whether or not the electronic -- the electronic
7 throttle control system may have played a role in this
8 accident at a high level.

9 Q Have you inspected Ms. Bookout's car?

10 A Yes, I have.

11 Q And have you done some testing at the vehicle?

12 A Yes. There were two inspections of the Bookout
13 vehicle. And DRE went to first inspection, which was for
14 plaintiff experts, and I sent an engineer to look at that,
15 and then I personally inspected the vehicle a month or so
16 later.

17 Q Have you been to the location where the crash
18 occurred outside of Eufaula, Oklahoma?

19 A Yes, I have.

20 Q Have you inspected an exemplar 2005 Camry?

21 A Yes, I have. Exemplar vehicle and exemplar
22 components.

23 Q Have you conducted some fault testing in this case?

24 A Yes, I have.

25 Q Tell us a little bit about what kind of fault testing

1 you did.

2 A Well, fault testing is essentially what it says it
3 is. In the automotive environment it is possible for
4 connectors to come lose or wires to chafe and touch when
5 they're not supposed to. So those occasions are very rare,
6 they have leave physical evidence if they do happen. What I
7 like to do on an exemplar vehicle is to verify the
8 diagnostic capability of sort of the -- in this case, it
9 would be the ECM, which you see over there on the table to
10 the right -- that is what the control module looks like for
11 the electronic throttle control -- to see how that responds
12 to faults that are possible, although rare in the real word
13 or real world environment.

14 Q You gestured to the table here in front of the jury.
15 Do you have some exemplar components, some components just
16 like the ones that are in Ms. Bookout's car?

17 A Yes. They're the same as in Ms. Bookout's car.

18 Q I see something that is sort of a yellowish-orange
19 there. What is that device?

20 A That is an automotive multimeter.

21 Q Okay. Do you use that to test these sorts of
22 components from the electrical and electronic standpoint?

23 A I do.

24 Q Will you be able to demonstrate that to jury during
25 the course of your testimony today?

1 A Yes, I will.

2 Q And I assume you also reviewed some Toyota documents
3 related to their engineering standards and test procedures
4 and so forth?

5 A I have. Yes.

6 Q Okay. Have you even, in fact, been to Toyota's
7 electromagnetic compatibility facility that just opened in
8 Michigan?

9 A Yes, I have. I went to visit that recently.

10 Q I think you mentioned that you reviewed a number of
11 some case-specific materials, did you not?

12 A Yes, I have.

13 Q Based on all the work that you have done in this
14 case, what sort of opinions do you hold within a reasonable
15 degree of engineering certainty, Dr. Livernois?

16 A Well, the first opinions related to the overall
17 development process that the Toyota uses to design, validate
18 and manufacture their engine control systems. My opinion is
19 that it consistent with the state of the art. I have worked
20 at two car companies, I worked in the industry for many
21 years. What Toyota does is equal to or better than what
22 other car companies do.

23 Q Do you have an opinion concerning the vehicle
24 electrical system on the 2005 Camry, and was it designed and
25 validated according to accepted industry practices and

1 standards?

2 A It was. Yes.

3 Q And then on the particular Camry in this case, Ms.
4 Bookout's 2005 Camry, do you have opinions concerning that?

5 A Yes, I do.

6 Q What is that opinion?

7 A The opinion is that this system in Ms. Bookout's
8 vehicle did not contribute to the accident. I found no
9 evidence that it malfunctioned, that there were any faults
10 that could be observed or reproduced, and that the
11 components, when looked at individually, performed just like
12 the components I will show you a little bit later.

13 Q Okay. Let's begin, as you mentioned earlier, you
14 have reviewed a number of Toyota engineering standards; is
15 that correct?

16 A Yes, sir, I have.

17 MR. BIBB: May I approach the witness, your Honor

18 THE COURT: Yes.

19 Q (By Mr. Bibb) Dr. Livernois, let me hand you this
20 red well, I will ask you to take a quick look over those
21 standards. Is that material, or a portion of the material
22 you reviewed for this case concerning Toyota's design and
23 testing of its electrical and electronic systems, in
24 particular the throttle control system in the vehicle?

25 A Yes. These are a subset of the documents that I

1 looked at.

2 Q You looked at a good deal more documents than just
3 those?

4 A Sure. What an engineer will do is start out with the
5 engineering drawing for the components and then that sort of
6 filters down and explains what the product has to do and how
7 it is validated. These fall under the category of
8 validation requirements.

9 Q And I think we actually have a blowup of the very
10 first one, which is Toyota Engineering Standard TSC 7108.
11 And kind of hard to read there. Can you kind of walk
12 through for the jury what this involves.

13 A Sure. The TCCS stands for Toyota Computer-Controlled
14 System. What you have in a document like this is the scope
15 of the document, which in this case it says the standard
16 covers the on-vehicle test method for the engine, for the
17 electronic control engine system. And then it goes on to
18 talk about the requirements, definitions, for example, the
19 name for system, the ECU.

20 The panel checker is something that is done to
21 verify the contents of memory, any deconvertors, and things
22 like that before during and after the testing so that
23 engineers are confident that the memory is going to do what
24 it is supposed to do. That is what a panel checker does.
25 Then this is just a standard status. It talks about test

1 conditions like temperature, humidity, barometric pressure.

2 Q Now, if we can go to the next slide. Now, what do we
3 have here, Dr. Livernois?

4 A A couple of pages into the document there is a table
5 that describes the variety of tests that are used to
6 validate an engine, an electronic engine control module.
7 Just as an example, it looks at the sensor outputs from such
8 as from the accelerator pedal, the engine crank position
9 sensor. If it is a variable valve system, it looks at the
10 position of the cam shafts, so there is a number of sensor
11 that provide information to the engine computer, and those
12 are checked and verified during the produce development
13 process.

14 They look at cold engine start. We can go down the
15 list and read them. The idea of electric noise, which is
16 EMI, there are a number of tests that are performed there.
17 And in those cases where it is packaged in the engine
18 compartment, for example, this vehicle doesn't have its ECU
19 in the engine compartment, it is in the passenger
20 compartment. When it packaged in the engine compartment,
21 there are immersion tests and, you know, immunity to
22 moisture and materials, and things like that that are run as
23 well.

24 Q Now, these tests, how long do they take to do --

25 A Well, typical --

1 Q -- in your experience?

2 A In my experience, a typical vehicle development
3 process for a new family of vehicles can last anywhere from
4 three to five years. And these tests are performed along
5 the way. It is probably six months to a year before a
6 vehicle is scheduled to begin mass production. It is
7 established that the production vehicle will meet these
8 requirements. So all of these tests are performed and the
9 vehicle is shown to meet requirements months, many months
10 before you actually begin to build them.

11 Q Now, and have you satisfied yourself that the 2005
12 Toyota Camry was subjected to all of these tests and was
13 validated by all these tests prior to its production?

14 A Yes, I have.

15 Q Now, let's just take off there from the where you say
16 electric noise test. And you mentioned earlier about a term
17 called electromagnetic compatibility or EMC. Maybe just
18 take us through exactly what is EMC and why do you want to
19 have a vehicle compliant or compatible with electromagnetic
20 energy?

21 A Well, EMC leaves electromagnetic compatibility. And
22 what I remember when I was a kid watching cartoons on a
23 Saturday morning is I had an older sister that used to like
24 to use blow dryers. And when I was watching Bugs Bunny, she
25 used her blow dryer and the screen would get all squiggly on

1 the TV; that would be an example of electromagnet
2 interference.

3 So it's important for an automotive control system,
4 like an engine control system, air bag system, even the
5 radio, it is important for all these systems to perform in a
6 manner that they're supposed to. And one of the things that
7 is ensured is that they first of all don't interfere with
8 each and then second of all, if there is any external forces
9 out in the real world they don't interfere with the
10 performance of these systems. So there is two parts to it.

11 Q Again, you also mentioned a term called
12 electromagnetic interference. And does Toyota test for
13 electromagnetic interference?

14 A They do. They do. In the table it talks about the
15 electromagnetic wave resistance test. That is what that is.
16 That is essentially pointing an antennae at the vehicle and
17 generating a 60-volt per meter electrical field and ensuring
18 that the vehicle operates proper.

19 Q And the testing for electromagnetic interference,
20 what sort of energy levels does Toyota test to?

21 A Well, at the vehicle level, which is sort of all the
22 pieces put together, you know, you have different suppliers
23 building different systems, and those are integrated into a
24 vehicle. The vehicle itself, once it is put together, is
25 validated at 60 volts per meter. But along the way, the

1 suppliers test their systems to 150 volts to 200 volts per
2 meter depending on the system.

3 Q Okay. So 60 volts per meter, what does that mean?

4 A Well, an electric field is actually a force field. I
5 don't want to get too technical, but essentially volts per
6 meter is the same as Newtons per Coulomb, which is a force
7 per unit charge. So what an electric field does, it puts a
8 force on a charged entity. And so that's why if it's strong
9 enough that it can affect charges. And charges are what
10 flow in wires and things like that, so that is why you have
11 to design against them.

12 Q When you run one of these tests, do you have to use
13 specialized equipment in a specialized building to test for
14 electromagnetic compatibility?

15 A Yes.

16 Q Can you tell the jury a little bit about that and why
17 you have to do that.

18 A Well, for the electric field testing, there is
19 something called an Anechoic chamber, which is essentially a
20 big sealed metal box that has material on the inner walls
21 that eliminate reflections. You point the antennae at the
22 car, and the radio wave hits the car, and the car is tested
23 in different directions. But the waves that bounce off the
24 car are then absorbed into the Anechoic chamber. And the
25 reason you want to do that is so that you can understand

1 what that vehicle would be exposed to out driving on a road.
2 Because when you're out driving on a road, the risk of a
3 close reflection is less, it is not something that typically
4 happens.

5 Q Okay. And talking about these Anechoic chambers, for
6 example, when you're testing an automobile and they are
7 doing vehicle tests, how large are those chambers?

8 A Well, they're bigger than this room; that is one
9 observation. And they have a big table in them that the car
10 can be put on and turned and things like that.

11 Q All right. Like a big turntable to spin the car
12 around during testing?

13 A That's correct.

14 Q How long do those tests take to run?

15 A Well, they're tested a hundreds of frequencies. And
16 you start high or you start low, and you run it for a few
17 seconds at each frequency, and you increment up. They can
18 take hours on end. The thing is, if there are issues along
19 the way, then you stop, figure out what happened, remedy it,
20 and move along.

21 Q And the chamber, you said it was sealed. Would it be
22 safe for me to go sit in the car while a 60-volt field is
23 applied to the car?

24 A Not for very long. I wouldn't recommend it. There
25 is a lot of debate about that, but 60-volts per meter is

1 beyond my comfort level. Certainly 200, you don't want to
2 go near it.

3 Q Now applying this -- we will come to it in a moment
4 -- did you actually go out and check the field strength at
5 the location where this crash occurred?

6 A I did. Along the path and where the crash occurred.
7 Yes, I did.

8 Q Will come back to that. Put those standards aside.

9 MR. BIBB: And we will identify them, your Honor,
10 and move their admission in this case at a break.

11 Q (By Mr. Bibb) But you brought with you some
12 component parts here; is that right, Dr. Livernois?

13 A That's correct.

14 MR. BIBB: May he step down, your Honor, and
15 describe what the parts are for us?

16 THE COURT: Certainly.

17 THE WITNESS: So this is the ECM and --

18 Q (By Mr. Bibb) ECM standard for what?

19 A Engine control module. And this -- in this vehicle,
20 this ECM is packaged forward of the glove compartment.
21 If you go in the car and open the glove compartment and do
22 you know how you press the glove compartment and it comes
23 all the way open, then you look in there and it is in there
24 to the right.

25 So this is the board. You can see pieces in that.

1 So that is your ECM. And there are connector that the
2 various sensors and actuators are connected --

3 COURT REPORTER: I didn't hear you. Please say
4 that again.

5 THE WITNESS: So this is the ECM. Then there are
6 these connectors that different sensors and actuators are
7 connected to through the wire harness in the vehicle.

8 Q (By Mr. Bibb) Dr. Livernois, try to keep your voice
9 up for the benefit for our court report. And for the
10 record, I believe the exemplar engine control module is
11 Exhibit 433A.

12 What other components do we have here?

13 A Next component I have is an accelerator pedal, same
14 part number as the pedal in Ms. Bookout's vehicle. And you
15 can see there is the pedal, there is the return springs to
16 keep the pedal at idle unless you are pressing on it. Up
17 here, there is an electrical connector that has six pins on
18 it. Inside here, this is the sensor. And the sensor
19 provides voltages proportional to how far the driver is
20 pressing the pedal.

21 So if I hold this down like this, and I press the
22 pedal, this is like a wide old throttle, and this is like
23 idle. The voltage coming from the two sensors will change
24 with that. That is how the ECM keeps track of what the
25 driver commands.

1 Q I think you were here for all of Mr. Arora's
2 testimony yesterday. Is this what you're talking about
3 here, the two voltages that are sent from the pedal to the
4 ECM?

5 A That's correct.

6 Q Okay. And for the record, the accelerator pedal is
7 Exhibit 433C. Now, in addition to -- so the signal -- or
8 two signals go from the pedal to the ECM. What does the ECM
9 then do?

10 A The ECM takes that information, it converts from an
11 analog signal to a digital signal, and it compares the two
12 signals to make sure they're compatible, then it proceeds to
13 calculate the target throttle angle and correspond with what
14 the driver wants.

15 Q And you have a throttle body there?

16 A I do. It is the right here.

17 Q Does that send a signal to operate the motor on the
18 throttle body?

19 A Yes. The throttle body is -- this is where air goes
20 into the engine. And based on the position of the throttle
21 valve, the sensors tell the ECM the position of the throttle
22 valve. Then the engine control module will open fuel
23 injectors and also time the spark so that the explosions
24 that occur in each cylinder of the engine, the exhaust from
25 that meets the exhaust emissions. That is why it is a

1 closed-loop control system. We need to make sure that,
2 first of all, the system meets driver demand and also meets
3 the regulatory requirements for emissions.

4 Q Okay. Then you also brought a brake switch with you?

5 A I did. I bought a brake pedal just to show how the
6 brake switch connects to the pedal. When you are sitting in
7 the vehicle, this is with the brake not pressed. You press
8 the vehicle (sic), and what happens is there is a little
9 button on the end of the brake switch that -- that is this,
10 the brake switch -- and there is two signals, STP and ST one
11 minus.

12 There is two signals that when the brake is not
13 pressed the little tab is pushed in. When you press the
14 brake, the tab lets out. You can feel there is a transition
15 point where one switch opens and one switch closes, and that
16 is basically when this switch tells the EMC, driver is
17 pressing the brake or the driver has let his or her foot off
18 the brake.

19 Q Dr. Livernois, are these individual components tested
20 for compatibility, electromagnetic compatibility?

21 A They are.

22 Q Were they the ones being tested somewhere between 150
23 and 200 volts per meter?

24 A That's correct. Yes.

25 Q And then the whole vehicle is tested at 60 volts per

1 meter?

2 A Yes.

3 Q Now, did you go out and investigate the potential for
4 electromagnetic interference at the scene?

5 A Yes, I did.

6 Q All right. Did you make field measurements.

7 A I did. I made two sets of field measurements at a
8 number of points along the path and at nearby locations.

9 Q Is this the sort of test equipment that you used?

10 A That's correct. Yes.

11 Q All right. Are we on Highway 69 headed south there
12 near the Texanna Road exit?

13 A Yes, sir.

14 Q What did you measure there? Tell us, A, what the two
15 devices are there you have got, then talk about what they're
16 measuring?

17 A Okay. This device up here is an electrical field
18 meter. And it measures the electrical field level in volts
19 per meter, the force field as I talked about earlier, in a
20 very broad frequency range from 10 megahertz up to 8
21 gigahertz, very broad. Then the meter beneath it is -- let
22 me go back. So these field levels here, these are typically
23 generated by cell phones, by radio stations and CB radios.
24 I know those are not as popular as they used to be, but that
25 is the sort of thing that they measure.

1 So this meter right here is a magnetic field meter,
2 and it measures fields generated by -- typically by power
3 lines, lower frequency fields, like an AC power line going
4 overhead.

5 Q So here as we approach the exit that Ms. Bookout and
6 Mr. Schwarz took, what did you measure as been the field
7 strength of the electromagnetic fields?

8 A Right. This meter up here, it is 97.3 millivolts per
9 meter. And a millivolt is 1/1000th of a volt. So that is
10 actually 0.097 volts per meter.

11 Q Okay. 0.097 volts per meter.

12 A Right. And the other meter is measuring something
13 called milligauss. And that value at this location is 5
14 milligauss. For reference, the earth's magnet field is 400
15 milligauss. In other words, this is a very small field.

16 Q Okay. Can we see the next slide. Are we on the ramp
17 now?

18 A Yes. Just moving closer to the exit.

19 Q And here it looks like we're heading down and you
20 will end up at Texanna Road, the intersection you can see
21 right behind your left index finger I think?

22 A Yes.

23 Q Can we blow up the measurements there. What did you
24 find at that location?

25 A So the electric field is 0.0862 volts per meter, and

1 the magnetic field is 5.6 milligauss.

2 Q Okay. And can we go to the next slide. Here we are
3 down at the intersection. Did you do a measurement there?

4 A I did.

5 Q What did you find there?

6 A The electric field was 7.7 millivolts per meter,
7 which is 0.0077. And the magnetic field was approximately
8 5.5 Milligauss.

9 Q Now, I see some power lines in the background there.
10 Did you also find some radio antennas nearby?

11 A As a matter of fact, I did. When I do a site map, I
12 look around for potential sources. And in this case, I did.

13 Q Did you find any electromagnetic field there that
14 would affect the operation of Ms. Bookout's car?

15 A I did not.

16 Q Okay. Can you, just for reference, can you show us
17 -- I think you put together a slide -- showing some typical
18 fields generated by a household fan or a microwave?

19 A So in the upper left, and this is the same meter that
20 I used. If you pop a bag of popcorn, for example, and you
21 put that meter right in front of the microwave, you will get
22 27 1/2 volts per meter. And that won't hurt you, 30 volts
23 per meter won't hurt you. When you get up to 60 or 100, you
24 want to be careful. So that's what you get in front of the
25 microwave. This on the right was some measurements that we

1 did on top of an office building in Louisville, Kentucky,
2 there was just a whole bunch of antennas up there, and we
3 found the combination of all the fields there was 23.6 volts
4 per meter.

5 Q Okay. Again, out at the location where you were
6 here, you were finding less than, what, 1/10th of a volt per
7 meter?

8 A Along the path I measured voltage, field levels that
9 were at, like, 1/10th of a volt per meter.

10 Q Okay. Far less?

11 A Yes.

12 Q Okay. Then you also measured that you had 5
13 milligauss or 5 1/2 milligauss?

14 A Correct.

15 Q And this box fan registers what?

16 A 1,474 milligauss.

17 Q So bottom line, is it your opinion that anything at
18 the site could have affected Ms. Bookout's car?

19 A My opinion is that nothing at the site could have
20 affected the performance of her vehicle.

21 Q Okay. Now, if we go to the next slide. You tested
22 each component from Ms. Bookout's car; is that correct?

23 A That's correct.

24 Q All right. And let's start at the beginning here
25 with the accelerator pedal. How do you go about testing the

1 accelerator pedal. And I guess before that, what are you
2 looking for when you're testing?

3 A The first thing that you look for with an accelerator
4 pedal is just physical damage: Is there a mechanical damage,
5 do the springs push the pedal back out to the idle position,
6 is the connector cracked, are the terminals bent or damaged
7 or corroded, things like that.

8 Q Did you find any that on Ms. Bookout's car?

9 A I did not.

10 Q Then did you go from there to doing some
11 measurements, some electrical measurements of the
12 accelerator pedal?

13 A Yes. There were a number of measurements performed
14 on the pedal. The measurements that I did in May were
15 independent of the vehicle computer, they were independent
16 of any diagnostic tools. It similar to the layout that is
17 in front of you.

18 Q Is this photograph that the jury is looking at right
19 now, is that the test set up with Ms. Bookout's accelerator
20 pedal on it?

21 A Yes. This was at a vehicle inspection in May of this
22 year, and that is her pedal.

23 Q Okay. And what sort of measurements were you able to
24 make with this apparatus?

25 A I wanted to monitor the sensor voltages and also the

1 force required to move the pedal and the associated voltage
2 from the sensor. So force versus voltage of the sensor, and
3 also just the general performance of the sensors.

4 Q Were you able to measurements the voltage over the
5 whole distance of pedal travel?

6 A Yes, I was.

7 Q Was it within Toyota specifications?

8 A It was.

9 Q Okay. So anything about the voltages sent from the
10 accelerator pedal, would that have anything to do with Ms.
11 Bookout's accident?

12 A No.

13 Q Now, did you also measure the -- what did you
14 measure, the resistance or the force that it took to move
15 the accelerator pedal?

16 A Right. The force versus the sensor voltage.

17 Q Can we see the next slide please. All right. You
18 have to explain this one to me.

19 A Okay. So right here is when you first start pressing
20 on the pedal with power applied, with 5 volts applied to the
21 pedal sensor number one, which is the sensor that the ECM
22 uses to interpret what the driver wants. You press the
23 pedal, and you get up to a point here where it takes a
24 little force to get off idle. Then you press further, and
25 the voltage, as you apply more force, the pedal moves in and

1 the voltage from the sensor increases.

2 So you see as you start here at idle, you press,
3 you move up here, you get to wide-open throttle, then you
4 begin to slowly let your foot off the pedal and come back
5 down back to idle. So what you see is that you will have
6 the same sensor voltage when you're pressing the pedal as
7 you do when you're coming back. But when you're coming
8 back, it takes less force because the rest position of the
9 pedal is at idle.

10 Q When you are driving along, you don't have to press
11 down so hard on the accelerator pedal as well, the
12 hysteresis of the pedal?

13 A Yes. The space between this line and this line is
14 what we call hysteresis.

15 Q Now, can you demonstrate how you would go about doing
16 some of your electrical measurements of the accelerator
17 pedal with your multimeter there?

18 A Sure.

19 Q Please, can you step down.

20 A Yes.

21 Q I think you may need Mr. Clark's assistance.

22 A I do. So what we have here, this is called a
23 breakout box. This is the connector that goes to the
24 accelerator pedal. And this wire here goes back to, for
25 example, the red wire here goes back to VPA-2, which is the

1 sensor voltage for the second sensor. So if we go here,
2 click it on like that. Then the next thing that I need to
3 do is I have a little box here. It will provide 5 volts. I
4 will show that to you.

5 This is the multimeter. It has all kinds of things
6 it can measure. I will measure what we call DC voltage. So
7 if I turn this box on, the light goes on. We should see
8 about 5 volts coming out of there. So we know the supply
9 voltage to the pedal is going to be what the sensors are
10 looking for. Then what I need to do next is to connect. We
11 will do sensor 1, then we will do sensor 2. So I connect 5
12 volts around to ground for sensor 1.

13 Q Be sure to keep your voice up.

14 A Sorry. Thank you. What we should see at this point
15 is we will go right here. We should see 5 volts being fed
16 to the pedal. So we see 5 volts, right? Now, if I go to
17 sensor 1, that is VC -- so at idle, we should see .8 volts.
18 That's the lower level there, .8 would be right there.
19 Right here.

20 So then when you press the pedal, you will see it
21 increase linearly up to 3.6, 3.7 volts. And that sensor
22 just goes straight up. If I then power up sensor 2, you
23 will see that that is going to be -- that should be about
24 1.6 at idle, which is what it is there. And then as you
25 press it should go up linearly. So what the ECM does, it

1 uses these two signals and compares them to make sure they
2 make sense. When it senses an issues with either one of
3 them, it will switch the vehicle into a failsafe mode.

4 Q You they resume your seat. Did you videotape this
5 same test on Ms. Bookout's vehicle?

6 A We videotaped a force versus voltage test. And I
7 believe the video that is being shown is the test for sensor
8 2. It should start at 1.6 volts and then go up.

9 Q This is actually on Ms. Bookout's car?

10 A It is. So here you see approximately 1.6 volts. As
11 you press down, this is in pounds, so it takes approximately
12 nine or so, maybe ten pounds to get down to wide-open
13 throttle. Then as you go back up, it takes less force and
14 you get back to the idle position.

15 Q So everything on Ms. Bookout's pedal -- did
16 everything work as designed?

17 A Yes, it did.

18 Q Now, there has also been a little bit of discussion
19 in the case about some sticky accelerator pedals. Did you
20 find any stickiness in this pedal?

21 A I didn't see any stickiness in Ms. Bookout's
22 accelerator pedal.

23 Q In fact, who is the manufacturer of Ms. Bookout's
24 pedal?

25 A The manufacturer of that pedal is companied called

1 Ison (phonetic).

2 Q To your knowledge, has Ison had any documented
3 complaints about sticky accelerator pedals?

4 A No, they have not.

5 Q Now, there has also been talk about floor mats. When
6 you inspected Ms. Bookout's vehicle, did you see any
7 evidence of any floor mat entrapment on the pedal or the
8 floor or the carpet or anything like that?

9 A No, I didn't see any evidence that would happen.

10 Q Do you have an opinion as to whether the floor mats
11 played any role in her accident?

12 A I do.

13 Q What is that?

14 A The floor mats did not play any role in the accident.

15 Q You also inspect the throttle body and throttle valve
16 in her car?

17 A Yes, I did.

18 Q And could you step down and show the jury how that
19 throttle valve works.

20 A All right. So the throttle valve, this is it here,
21 it also operates on a 5 volt supply that the sensors use in
22 order to provide the position of the throttle valve back to
23 the ECM so it can establish it is where it wants to be.
24 This is the accelerator pedal. We will move him over here.
25 And this is throttle pedal.

1 So here on the throttle valve there are connectors
2 or circuits for sensors and also for the motor. Click that
3 on. And I will apply ground. So what we have are two
4 circuits that control the motor. We have two sensor
5 signals: VTA and VTA-2. Then we have the 5-volt supply.
6 When that valve moves, we will see -- first look at VTA in
7 idle. We see that it is -- so we should see about .95
8 volts, and that's what we the nominal position of the
9 throttle. That is approximately 6.5 degrees. That is what
10 happens when there is no power to the motor, that is when
11 the springs flip the throttle body.

12 If we move a little bit, we will see that the
13 voltage goes up linearly. Then we go back to the nominal
14 position and push the other side you see the voltage
15 decrease. Because when the vehicle started, the throttle
16 actually closes a little bit. And -- okay. So we can do
17 the same thing for the second sensor. And you see it is
18 about 2.58 at nominal, press it, it goes up. This one
19 reaches a maximum then it goes flat. So that's how the
20 throttle sensors work.

21 Q Did you perform this test on the throttle of Ms.
22 Bookout's vehicle?

23 A Yes, we did. I did.

24 Q Do you have a video of that?

25 A Yes. There is a video related to the throttle.

1 well, the video doesn't show any voltage testing, the video
2 shows that Ms. Bookout's throttle valve snaps back to idle.
3 We did do measurements that showed that it was essentially
4 the same as this, and so the sensors were working fine, the
5 springs in the throttle valve were working fine.

6 Q And that is the throttle of Ms. Bookout's vehicle?

7 A It is.

8 Q Now, there has been some discussion of performance
9 Federal Motor Vehicle Safety Standard 124. Is there an
10 Federal Motor Vehicle Safety Standard that applies to the
11 throttle control system?

12 A Yes, there is.

13 MR. BIBB: May I approach, your Honor.

14 THE COURT: Yes.

15 Q (By Mr. Bibb) Let me hand you a couple of documents,
16 three documents. Is that a copy of Federal Motor Vehicle
17 Safety Standard 124 as well as the compliance documentation
18 showing that the 2005 Toyota Camry's throttle system
19 complied with the requirement?

20 A So the requirement is that when the pedal and the
21 throttle go to wide-open position, and you let them go, they
22 have to go back to the nominal or the idle position in a
23 second or less at 28 degrees or 70 degrees Fahrenheit. When
24 it is really cold, things can slow down, lubrication can get
25 thicker, and the regulation says it has to do that within

1 three seconds. This engineering report shows that the
2 throttle body in the 2005 Camry meets the requirements of
3 the FMVSS.

4 Q Okay. Now, so when you examined Ms. Bookout's
5 vehicle, as we saw on the video, did her throttle close
6 within a second?

7 A It did. I almost got my finger caught, actually, so
8 it goes pretty quickly.

9 Q Now, another component you showed us earlier was the
10 brake switch, Dr. Livernois. Did you inspect the brake
11 switch on Ms. Bookout's Camry?

12 A Yes, I did.

13 Q Does the brake switch play a role in the operation of
14 the failsafes in this vehicle?

15 A It does. Yes.

16 Q And does it -- how much do you have to press on that
17 brake pedal to transition or to make the brake switch go
18 from off to on?

19 A It is a matter of millimeters. Not very far at all.

20 Q And there is a little plunger that you demonstrated,
21 and it is attached and when -- it is normally in the off
22 position when the pedal is not depressed; is that correct?

23 A STP is an open circuit. When you go in a room and
24 flip the switch, you are closing the circuit when the lights
25 go on. When the brake is not pressed, the main brake signal

1 is an open circuit.

2 Q Okay. And as far as the testing that you did on the
3 brake switch, what sort of testing was done on the brake
4 switch for Ms. Bookout's vehicle?

5 A Well, the brake switch is a very important basic-type
6 component. So the testing that you do you just verify, and
7 I did this, when the button is moved does the transition of
8 the two switches: STP, which is the main switch, then there
9 is a second switch in there, ST one minus, which is used as
10 a redundant safety check on STP, they should transition
11 appropriately. And that's what I checked for when I looked
12 at Ms. Bookout's switch.

13 Q Is this the test apparatus used to test the brake
14 switch in Ms. Bookout's vehicle?

15 A That's right. In April of this year, an engineer of
16 mine monitored or watched the inspection of the brake switch
17 by the plaintiffs' experts. And we checked out their
18 fixture, and we decided to use their fixture instead of
19 ours. The result was basically the same. Basically what
20 that fixture does is you can see the little crank on the
21 top. If you turn that little crank right there, it measures
22 the position as you rotate it. And it has a little actuator
23 on the end that will allow the button to come on.

24 Q Okay. Okay. And what were the results of the
25 testing?

1 A So the results of the testing were that STP, the main
2 switch signal, which is the yellow line, operated exactly as
3 it was supposed to. And the monitor switch, ST one minus,
4 did the same. If you look here, this channel 1 and channel
5 2, they say 4 volts. What that means is 4 volts per
6 division vertically. If you look, we have one, two, three.
7 We were applying 12 volts to the brake switch because that's
8 what the vehicle does. When you do that, and you press the
9 button in and you press it out, the two switches transition
10 the way they should.

11 Q On the Ms. Bookout's vehicle, did the brake switch of
12 operate as it was designed to?

13 A Yes, it did.

14 Q Did you see anything about the operation of the brake
15 switch that could have played a role in Ms. Bookout's crash?

16 A I did not.

17 Q Okay. And, again, so we have two switches in the
18 brake switch; is that right?

19 A Yes.

20 Q And we get two signals in the accelerator pedal; is
21 that correct?

22 A That's correct.

23 Q And you have two signals coming from the throttle
24 body back to in ECM; is that correct?

25 A That's correct.

1 Q And so there is always a main and a check, a value or
2 check switch in this case to always be a redundant safety
3 feature in these vehicles?

4 A That is correct.

5 Q In fact, are there -- is there a main and monitor CPU
6 inside the circuit board there?

7 A Yes, there is.

8 Q So they have two computers, one checking the other,
9 correct?

10 A Yes, that's correct.

11 Q Now, what powers this whole system?

12 A Well, the vehicle 12-volt vote box, as I call it, is
13 the battery plus the output from the alternater. So that
14 powers everything in the vehicle ultimately.

15 Q And the battery and the alternater provide how many
16 volts?

17 A Between 12.6 volts to 13 1/2 depending on what the
18 alternater output is.

19 Q Does the electronic throttle control system work at
20 12 volts?

21 A No. It operates on -- it uses 12 volts, but it
22 regulates and filters the voltage from the vehicle. And it
23 uses 5 volts, 2 1/2 volts, and 12 volts. But it also uses
24 12 volts differently than what comes from the battery and
25 the alternator.

1 Q And Dr. Arora showed up on the circuit board that
2 there are a whole bunch of components that are used to
3 filter and stabilize the voltage; is that correct?

4 A Yes, that's correct.

5 Q And to step down the voltage to 5 volts or 2 1/2
6 volts, whatever is needed for the system; is that right?

7 A Yes, it is.

8 Q When you examined the power supply and the voltages
9 in this is vehicle, did the voltages all appear to be
10 correct? When I say "this vehicle," Ms. Bookout's vehicle.

11 A Yes. All the testing that was done indicated that
12 the ECM was operating properly. The ECM wasn't tested with
13 this voltmeter or this multimeter. The ECM was tested with
14 a tool called Tech Stream by plaintiff and defendant
15 experts, and we all found the same thing, which was the
16 ETCS-i system did precisely what it was supposed to do in
17 Ms. Bookout's vehicle.

18 Q And you are familiar with Ms. Bookout's testimony and
19 I think the one service record we had before the crash of an
20 oil change, was there ever any complaints about the
21 operation of any component in the electronic throttle
22 control system prior to the wreck?

23 A Not that I'm aware of. No.

24 Q And you have read her testimony. Did she seem to
25 have any problems with the engine or the brakes on this

1 vehicle on the day of the accident prior to the wreck?

2 A That's my understanding that's what she said. Yes.

3 Q Couple more things, and we will finish up, Dr.

4 Livernois. One was the cruise control. Did you also
5 examine the cruise control on the vehicle?

6 A I did. Yes.

7 Q Did you find anything out of the ordinary on that?

8 A No. Cruise control switch operated just like the
9 service manual said it should.

10 Q Do you believe the cruise control in any way
11 contributed to Ms. Bookout's crash?

12 A No. It is my understanding that Ms. Bookout didn't
13 use the cruise control in any event. But if she did, it
14 would have operated fine.

15 Q Now, when you go to do vehicle inspection, Dr.
16 Livernois, do you just look at the individual components
17 that we have here on the table, or do you do a general
18 inspection of the vehicle overall when you're there?

19 A I tend to look at the vehicle on an overall basis to
20 the extent that it affects the parts that I'm interested in
21 understanding; in this case, it is the engine control
22 system. And that runs pretty far into the vehicle, so I
23 tend to look at the engine, the wiring, the components of
24 the system, fuse box, things like that.

25 Q Do you also examine the controls of the vehicle the

1 see if there is anything on the interior that could affect
2 the operation of the electronic throttle control system or
3 other aspects of the car?

4 A I do. I do.

5 Q Do you have a photograph of the controls here looking
6 in the interior of the vehicle there?

7 A There should. Be right.

8 Q Was this done at the time of your inspection?

9 A Well, this was an exemplar vehicle.

10 Q Okay.

11 A With a case like this, I will get an exemplar vehicle
12 so that I understand the vehicle before I actually go and
13 look at it. That way, I believe I can do a better job of
14 evaluating a vehicle that has been in an accident if I look
15 at a vehicle that hasn't been in an accident. So this is
16 what you see, you know, the hood is open, this is the door,
17 you have window controls, seat controls, steering wheel,
18 shift lever, things we all know what they are.

19 Q Does this show the parking brake lever?

20 A It shows the emergency brake lever right here. Yes.

21 Q And is the parking brake applied in that photograph?

22 A No. This will is the off position.

23 Q Okay. That is without it being lifted up at all?

24 A That's correct.

25 Q That would be its nominal position in the car?

1 A Yes.

2 Q If you're driving down the car without the parking
3 brake on, that is where it would be?

4 A Yes.

5 Q Now, have you reached some conclusions in this case?

6 A Yes, I have.

7 Q Just to sum up, what are your opinions in this case?

8 A First opinion is that the design process used by
9 Toyota for their vehicles is sound. It is consistent with
10 state of the art in this time frame, the design and
11 validation process.

12 The second is that specifically the 2005 Camry
13 electrical system is consistent with state of the art, as is
14 the electronic throttle control system. It is a sound,
15 robust system that is reliable. It does what it is supposed
16 to do. Those relate to the vehicle.

17 Another opinion is that electromagnetic
18 compatibility did not play any role in this crash. None of
19 the components of the ECTS-i system, the throttle valve, the
20 accelerator pedal, the brake switch, the ECM, there is no
21 evidence to indicate they played any role in this accident.
22 And to a reasonable degree of engineering certainty, it is
23 my opinion that they didn't play a role, they just didn't.
24 They operated as they were supposed to.

25 MR. BIBB: One moment, your Honor. Thank you very

1 much, Dr. Livernois.

2 THE COURT: Cross-exam.

3 CROSS-EXAMINATION

4 BY MR. PORTIS:

5 Q May it please the court, Dr. Livernois, what was the
6 date of the wreck?

7 A It was in 2007.

8 Q September 20, 2007; is that right?

9 A That's correct.

10 Q Are you telling this jury that everything operated
11 normally on September 20, 2007?

12 A What I'm telling the jury is that the evidence that I
13 looked at before the crash, the performance of the vehicle
14 system before the crash, the evidence that we have indicates
15 it was operating fine. After the crash, the electronic
16 throttle control system was operating fine. I wasn't there
17 on September 20, 2007, but the evidence says that the
18 vehicle was operating fine and did what the driver commanded
19 it to do.

20 Q Well, you understand that there were 150 feet of skid
21 marks left, right?

22 A I've heard numbers of like 100 feet of skid marks;
23 perhaps it is 150 if you say.

24 Q Okay. Where did you hear the 100 feet from?

25 A I think yesterday or in depositions from experts.

1 Q Well, there was some testing done where the vehicle
2 stops within 100 feet. Is that what you heard?

3 A It could be.

4 Q You did some car testing, didn't you?

5 A I did fault testing on the electrical system. That's
6 correct.

7 Q Was that the testing -- was that testing that we
8 looked at yesterday with Mr. Arora?

9 A No, that was not.

10 Q Different testing?

11 A Yes. I did not participate in that testing.

12 Q Did you do any stopping distances in your testing?

13 A Our testings wasn't related to stopping distances,
14 although the results that we have will give us that.

15 Q Well, in this case when we talk about whether the car
16 operated normally on this day, we know that -- that she is
17 traveling -- do you know what the accident
18 reconstructionists say?

19 A Roughly. Yes.

20 Q Okay. What do you think Mr. Stopschinski says?

21 A That -- that it was driver -- that the vehicle was
22 going down the exit ramp, and there -- there may have been
23 brake application, there may have been accelerator pedal
24 application, but probably occurred too late and the accident
25 then occurred.

1 Q Right. But the speeds, I guess I'm asking speeds.

2 A My recollection is the impact speed of the embankment
3 was around 30 miles an hour. Then at the start of the ramp,
4 Ms. Bookout testified that she was driving approximately 70
5 miles per hour and there was obviously a gradual slowdown
6 between that and the impact.

7 Q Fair enough. Let me help you out just a tad. At the
8 point where there are skid marks on the road, I think the
9 testimony is that Mr. Stopschinski says it -- she was
10 traveling approximately 50 miles per hour at that point in
11 time, all right?

12 A If you say so.

13 Q And Mr. McCort says she is traveling anywhere from 40
14 to 45 miles an hour, all right?

15 A Okay.

16 Q Now, at the point of those skid marks, based upon
17 your understanding is in order for there -- and I think we
18 may have talked about this in the your deposition -- in
19 order for there to be skid marks, what causes a skid marks?

20 A Well, there is a couple of things that can cause skid
21 marks. Obviously, application of brake, you know, something
22 that causes the tire to stop rotating so that it locks up.

23 Q In other words, the rubber on the tires is leaving an
24 imprint on road itself, right?

25 A Tire marks. Yes.

1 Q And so at that particular point in time whether she
2 is traveling 40 to 45 or whether she is traveling 50 from
3 150 feet out, we know, right, that a vehicle, if you apply
4 the pedal -- and you believe she applied pedal, right,
5 because there skid marks?

6 A Well, I -- I believe she applied the brake pedal at
7 some point. I don't know exactly when.

8 Q And Dr. Young says that someone in this situation
9 would apply the pedal ballistically. Do you remember that
10 when you were in here listening to his testimony?

11 A I did not hear Dr. Young's testimony.

12 Q Under your scenario, she at least applies the brakes
13 that the rubber on the tires leaves a skid mark on the road,
14 right?

15 A Or it slows down enough to leave a mark. I'm not a
16 tire expert, so there could be conditions. My recollection
17 is it was a very warm day, so the rubber could have been
18 soft on the tire. I didn't do that analysis.

19 Q So if she applies the brakes and then she should stop
20 anywhere from 100 feet, is what we primarily heard, but the
21 largest measurement that we have on testing is 133 feet,
22 right?

23 A If you say so.

24 Q So there is something going on with this car, and it
25 is not normal. Is that fair to say?

1 A Well, it is not just the car, you know. The -- all I
2 can tell you is based on the work that I've done. I don't
3 know exactly what happened in that car, but the car -- the
4 evidence of the car before and after says it was operating
5 fine at the time of the crash.

6 Q She has timely applied the brakes, she applied the
7 brakes, and the car should stop within 100 feet, at the most
8 133 feet, right?

9 MR. BIBB: Objection, your Honor. This was way
10 beyond any questions that was asked on direct.

11 THE COURT: Overruled.

12 THE WITNESS: If the brakes were applied only, the
13 vehicle would have stopped before the impact. If they were
14 applied with a reasonable amount of force, the vehicle would
15 have stopped before impact.

16 Q (By Mr. Portis) And not only did it not stop, but it
17 ran into a bank traveling 27 to 30 miles per hour. That is
18 not normal, is it?

19 A Well, there is no question that an accident occurred.
20 What we don't know exactly what was going on with the
21 pedals.

22 Q Is that normal, sir?

23 A Is what normal?

24 Q For someone to apply the brakes -- it is a stop -- is
25 supposed to stop within 100 to 133 feet yet it runs into a

1 bank and it is still traveling at 27 to 30 miles an hour?

2 A Well, I wouldn't qualify it as normal, I would
3 qualify it as an accident that occurred because the brakes
4 weren't applied in a timely manner; that's the best I can
5 do. I didn't do the accident reconstruction; that's not my
6 area of expertise. But I've driven this car, and I know it
7 stops when you apply the brakes.

8 Q Why would you say they're not applied in a timely
9 manner when we know that at that point in time when the
10 brakes were applied, under your theory, when the brakes were
11 applied, they should have stopped within a 100 to 133 feet?

12 A I don't know if I was that specific. But my
13 understanding is that if the brakes were applied as
14 testified then the vehicle would have stopped.

15 Q In fact, what your study showed is that the brakes
16 worked on Ms. Bookout's vehicle, right?

17 A Which study?

18 Q You apparently ran some studies to show that the
19 brakes themselves were working after the wreck; is that
20 right?

21 A Well, the components that the ECM uses to decide to
22 depower the vehicle, in other words put the vehicle back at
23 idle when you release the pedal, those components all worked
24 fine.

25 Q If the brakes are working, which you say they were on

1 this day, and she applies them 150 feet away, and they're
2 working, then she should stop?

3 A Yes.

4 Q Before she ever hits the bank?

5 A I know Mr. Walker testified to that, and Mr. Walker
6 testified in his deposition the brakes after the crash were
7 fine, things of that nature. The answer is: If the brakes
8 were applied as you describe, the vehicle would have
9 stopped.

10 Q And the reason it didn't is because this car was
11 suddenly unintended acceleration, right?

12 A I don't agree with that. No.

13 Q Well, let's talk about that a little bit. You're not
14 at computer engineer, right?

15 A I am not a computer engineer. I'm an electrical
16 engineer.

17 Q And when you say that you have -- you didn't -- you
18 talked about a Dodge vehicle and the 5.7 liter engine that
19 you were involved in that had the first electronic throttle
20 control system that you had been involved with, right?

21 A In the industry. That's correct.

22 Q And you were looking at the environmental issues. In
23 other words, how is this electronic throttle control system
24 going to be work in the environment of the entire vehicle,
25 right?

1 A That is part of what we looked at. That's correct.

2 Q You didn't design the source code for that electronic
3 throttle control system?

4 A I didn't.

5 Q You don't do any of the engineering related to the
6 software, right?

7 A I did not.

8 Q You don't do any of the engineering related to the
9 hardware, correct?

10 A That's correct.

11 Q So really what you did is that -- that particular
12 part of the -- that particular part of the electronic
13 throttle control system was put in that environment. And
14 you wanted to make sure that it was going to operate within
15 the car's environment; is that right?

16 A That's correct.

17 Q And I think that in your testimony you indicated that
18 it was a 2005 Dodge Durango; is that right?

19 A It may have been -- my recollection it was a 2004.
20 And the truck platform, the first application of the 5.7, as
21 I recall, was a 2003 truck. Then in '04, it was a Durango.
22 It was in that time frame. Because I left Dodge truck in
23 2003, but we were working -- sorry in 2000 -- but at that
24 time we were working on future vehicles.

25 Q All right. The -- at the time, your group was

1 responsible for the design and release of transmission and
2 brake electronics; is that right?

3 A And also interaction and compatibility with engine
4 control systems.

5 Q And one of your goals would have been to make sure
6 those systems are reliable; is that right?

7 A That's correct.

8 Q You were in charge of the power train as well; is
9 that right?

10 A I don't know what you mean by "in charge of my
11 group."

12 Q Your group. You were in charge of the group
13 overseeing the power train for the Durango, right?

14 A No. My group was in charge of the group overseeing
15 the electrical transmission control module and some of the
16 other chassis-related electronics. Part of the engineering
17 effort that we did is interacting with the group that was
18 actually responsible for the engine control module. So I
19 had an understanding of the engine control module and the
20 control system, and I worked with them, but I didn't
21 formally release those parts. They weren't my formal
22 responsibility.

23 Q You were just in charge -- were you in charge of the
24 power train?

25 A I think I just explained what I did. We fell under

1 the -- power train is transmission and engine, and my group
2 fell under that umbrella.

3 Q Were you in charge of the electronics?

4 A For?

5 Q For that Durango?

6 A I've explained what -- what -- what parts of the
7 electronics my group worked on already.

8 Q For what you were in charge of, were there any
9 recalls involving the power train or the electrical system
10 on that Durango?

11 A There may have been. All car companies have recalls,
12 so...

13 Q Well, was it -- do you know if it was -- there was a
14 recall because there could be a potential instrument panel
15 fire on the car that you were in charge of the electrical
16 system?

17 A I was not in charge of the instrument panel. If the
18 NHTSA database says that, then I have no reason to disagree
19 with them.

20 Q On that vehicle, it says -- what is an ESP system?

21 A That is electronic stability control.

22 Q And on that there was a service bulletin it may
23 prematurely activate momentarily when negotiating a curve.
24 Does that sound familiar to you?

25 A Well, it depends on the year. What is the -- if that

1 was a recall or a service bulletin, what is the --

2 Q It is a service bulletin.

3 A For what model year?

4 Q This will would be on the 2004 Dodge Durango?

5 A So that would have been the -- related to the power
6 train control module.

7 Q This involves selectively erasing and reprogramming
8 the power train control module with new software.

9 A That happens frequently. When there is a drivability
10 issue, then a lot of times the algorithms are updated to
11 change a parameter, for example.

12 Q And so that is just normal for the vehicle to act up
13 like that?

14 A Well, I would say that if you looked at all the
15 company companies over the past ten years all of them have
16 had similar TSBs. Drivability is a very common issue in
17 vehicles, so that doesn't surprise me.

18 Q Okay. This was the vehicle that you were responsible
19 for, though, right?

20 A I was responsible for a -- subsystems in that
21 vehicle. I was not responsible for the vehicle.

22 Q Now, you mentioned Mr. Arora during your direct
23 examination, right?

24 A I recall speaking about or answering a question about
25 that. Yes.

1 Q Now, you know Mr. Arora, don't you?

2 A Yes, I do.

3 Q And, in fact, you were -- when you were talking about
4 your -- when you were talking about your papers that you
5 wrote, in fact, you have written papers with Mr. Arora,
6 correct?

7 A Yes. We have coauthored I believe three papers
8 together.

9 Q And you wrote about batteries, right?

10 A Right.

11 Q On a couple of occasions you wrote about some
12 batteries?

13 A I have written about -- I helped coauthor a chapter
14 in a book about lithium ion batteries in the automotive
15 environment; that is paper I have done on batteries. Mr.
16 Arora may have done others.

17 Q But he wrote a battery paper with you, correct?

18 A Yes. Well, a chapter in a book. Yes.

19 Q Then I think you also wrote a paper of
20 electromagnetic arching?

21 A Well, it is not electromagnetic, it is just arching,
22 a series arches in automotive systems.

23 Q Okay. And so you were -- you were working at
24 Exponent with Mr. Arora up until 2010; is that correct?

25 A Well, I worked at Exponent until 2010 in the Detroit

1 office. He was in the Phoenix office, but we did do some
2 work together. I wouldn't say I worked with him.

3 Q All right. And in the Toyota unintended acceleration
4 cases that you have -- you were involved in those, you were
5 hired when you were at Exponent, correct?

6 A I was contacted near the end of 2009 when I was at
7 Exponent, but I didn't do any substantial work on any Toyota
8 products when I was at Exponent. I left and joined DRE in
9 early 2010.

10 Q And you understand, don't you, that Exponent was also
11 hired at the same time; is that right?

12 A At the time I didn't know that. I did not know about
13 the work that Exponent was doing. I wasn't involved with
14 that related to the report in 2010.

15 Q Were you part of their public response team like Mr.
16 Arora was in 2010?

17 A No, I was not.

18 Q So you did your own thing for Toyota, correct?

19 A Well, Toyota retained me on individual cases when I
20 joined DRE. As I said, I was contacted in late 2009, but I
21 didn't do any substantial work on Toyota products when I was
22 at Exponent.

23 Q And you worked in the Detroit office of Exponent; is
24 that right?

25 A That's correct.

1 Q And I believe Toyota is about to call a gentleman,
2 Dr. Lange, following your testimony here today. Do you know
3 him?

4 A I've met Mr. Lange. Yes.

5 Q You have. Well, not only did you meet him, you
6 worked in the same office with him?

7 A For about a year. We worked a year or so together.

8 Q So you know him intimately?

9 A No. He was on the road, I was on the road. I don't
10 know him intimately. I know him just in meeting him.

11 Q You're in the same office?

12 A When you travel a lot, we didn't see each other very
13 much.

14 Q So Mr. Arora, Mr. Lange, you know Mr. Stopschinski?

15 A I do know Mr. Stopschinski.

16 Q At Carr Engineering?

17 A Yes.

18 Q And now you work at DRE since 2010 and 2013?

19 A Since 2010; that is correct.

20 Q And the members at DRE are actually former Exponent
21 employees, correct?

22 A Some of them are. Yes.

23 Q Now, when we talk about that you reviewed Toyota
24 design and testing, you didn't review the software, right?

25 A I did not review the software itself. I reviewed

1 documents related to the software.

2 Q So if I were to go over here -- and we won't got
3 through this entire list -- I just want to make sure -- if I
4 were to go through and talk about single point of failure
5 and software, that is not something you're here to testify
6 about today; is that correct?

7 A That's correct.

8 Q If it had a single point of failure, you're not here
9 to say whether that is good or bad or defective or not,
10 right?

11 A I'm not here to testimony about software.

12 Q Because you haven't looked at the Toyota software?

13 A That's correct. I have read reports that have
14 evaluated it, but I personally have not looked at the code.

15 Q So when you say that when -- I think you said when
16 there is no evidence of malfunction in Bookout, you weren't
17 referring to the software?

18 A Well, in a way I am because, you know, we know Mr.
19 Arora has looked at the software in great detail. We know
20 that NHTSA and NASA have both looked at it. And we know
21 that no entity has found a way in the software, even with
22 changing the code, to make that throttle open or stay open
23 when you press the brake. So I'm basing my opinions on the
24 fact that the ECM operated as it was supposed to. And there
25 is documents that support that.

1 Q Well, did you know that -- did you know that Toyota
2 didn't even know what was in their operating system? I
3 think it is called OSEC, they didn't know what the software
4 was about, and what was going on in the software system in
5 this car. Do you think that is reasonable?

6 A When you say Toyota, are you talking about an -- it
7 is possible that an individual at Toyota didn't know, but
8 that doesn't mean that Toyota itself, someone at Toyota
9 didn't know.

10 Q Well, all right. Did you know that they did no
11 design review on the software?

12 A I didn't know. If you say so, but I didn't know
13 that. I mean, oftentimes the supplier will do those sorts
14 of things and then report to the OEM.

15 Q I'm just asking if you know. Do you know what an
16 ESP-B2 chip is?

17 A Not offhand I don't.

18 Q So I guess you didn't know they didn't even know what
19 the software was for that ESP-B2 chip?

20 A Okay.

21 Q Is that right?

22 A I don't know if they know or not.

23 Q Because you didn't look at the software?

24 A That's correct.

25 Q Now, you talked about these two voltages that are

1 sent from the pedal to the ECM; is that right? And I think
2 you came over here and you showed. I think you put
3 everything up to speed and were showing the different
4 voltages of the two voltages, right?

5 A Yes.

6 Q They go to the ECM; is that right?

7 A Yes.

8 Q And you don't -- and I know that you also talked
9 about that those voltages go to the ECM, and they're
10 converted from analog to digital and then sent out to the
11 rest of the ECM, correct?

12 A Yes. First they are filtered and then they are
13 converted from analog to digital.

14 Q And you don't know anything about once those two
15 voltages go to the conversion from A to D about whether
16 there is a single point of the failure there?

17 A I haven't look at the software to try an understand
18 what you mean by single point of failure. I believe Mr.
19 Arora talked about that.

20 Q Fair enough. And none of your testing was done, and
21 none of the work that you have done relates to whether or
22 not there is a loss on vacuum in the brakes, right?

23 A That's correct. I didn't look at that.

24 Q And you know that a loss of vacuum can occur when the
25 throttle is open and someone is pumping the brake, right?

1 A I understand that can happen.

2 Q Would you agree with me that the internal Toyota
3 people know more about electronic throttle control systems
4 than you?

5 A It would depend on the person. There are probably
6 people in Toyota that know as much as I do about their
7 system. In terms of how the system works, I'm comfortable
8 that I know about its diagnostics, how it functions, things
9 like that.

10 Q Did you speak to any of those people who know more
11 than you at Toyota who actually designed this system?

12 A Early on, when I was retained in this work for
13 Toyota, I did have a conference call with engineers from
14 Toyota because I had some questions about it. I don't know
15 if they knew more than me or not.

16 Q Well, you don't know if they knew more than you?

17 A At that time, I was interested in the things like
18 what are the validation levels for EMC just to confirm.

19 Q What were their names?

20 A I do not recall. This was two or three years ago.

21 Q So I don't guess you know if they are coming to
22 testify?

23 A I don't know who is coming to testify after me.

24 Q Now, as part of your -- as part of your work in this
25 case, you mentioned that there are -- you were asked in your

1 deposition about whether or not the way Toyota does its
2 electronic throttle control and its failsafe whether that
3 was standard in the industry, is it fair to say that you
4 believe that other companies do it differently?

5 A When you say "failsafe," the way I would -- I mean,
6 I'm not sure what you're asking frankly. Other companies do
7 design and validate their systems slightly differently than
8 Toyota. Every car company has their own way of doing
9 things. But I've always said, and I learned this, is that
10 the product drives the development process. So each company
11 is slightly different, but at the end of the line, their
12 product meets the requirements. And those requirements are
13 fairly common between companies, because the markets are
14 common to the companies.

15 Q Do you have your deposition with you?

16 A I don't.

17 MR. PORTIS: May I approach.

18 THE COURT: Yes.

19 Q (By Mr. Portis) Maybe you and I can read along.

20 Page 33 and 34. This question was:

21 "Now, the way Toyota set up this VPA-1 and VPA-2, is
22 that standard in the industry?

23 All right. And your answer was what?

24 A Right. I wasn't sure what you were asking.

25 Q I just need your answer.

1 A That's correct. That's what I said.

2 Q what did you say?

3 A I said:

4 "Is what standard?"

5 Q "This failsafe method that Toyota set up."

6 what was your answer?

7 A "I think failsafe, I have worked many years in the
8 industry for both OEMs and suppliers, and failsafe, it
9 is a design philosophy, so it is not unique to throttle
10 control systems, it is unique to vehicle systems in
11 general. In my experience of electronic throttle
12 control and other OEMs is they all have some level and
13 some type of failsafe mechanism, so that idea that it is
14 failsafe is standard in the industry but the details of
15 how different companies do it may not be the same."

16 Q "And I'm asking if the way Toyota does it is that
17 standard in the industry?"

18 what was your answer?

19 A "No. Other companies do it differently."

20 There isn't a standard for how you do failsafes,
21 there is just requirements to develop a reasonably safe
22 system.

23 Q And you didn't look into whether they followed MISRA
24 or didn't follow MISRA, right?

25 A Not in any detail. I didn't look at that.

1 Q And you didn't look to determine whether Toyota
2 followed its own safety standards, correct?

3 A I've heard testimony about that, and my understanding
4 is if they did --

5 Q I'm asking if you did, if you analyzed it.

6 A I didn't analyze that. No.

7 Q Okay. Now, as part of -- in your lifetime, you have
8 written two novels, am I right?

9 A No. Well, two, but it is essentially the same novel.

10 Q And the names of those novels are *Drachman's*
11 *Dilemmas*; is that right?

12 MR. BIBB: Objection, your Honor. Approach.

13 THE COURT: Yes.

14 (The following bench conference was had outside the
15 hearing of the jury:)

16 MR. BIBB: I assume --

17 THE COURT: These are novels that he has written.

18 MR. BIBB: He has written. And there is a line in
19 there, one of his characters does like lawyers.

20 MR. PORTIS: It goes further than that, your Honor.
21 It is specifically about a man who graduated from Michigan
22 Tech. It is specifically about a man who is an engineering
23 consultant. It is specifically about a man who is an
24 engineering consultant who says, Look if I do it a certain
25 way then they will pay me more money, these car companies

1 are going to pay me more money. I just want to be able to
2 go into that in terms of his bias.

3 MR. BIBB: That is so far from anything in this
4 case. It is a novel.

5 MR. PORTIS: It is before this was published.

6 THE COURT: I'm going to allow it only if you can
7 first lay a foundation this is anything other than fiction.
8 If you can lay a foundation that this is all based upon his
9 life or the life of another person, then --

10 MR. PORTIS: He will say it is fiction. But, your
11 Honor, at the end of the day, he wrote it. It is his work.
12 It is not some other author. It is his work specifically
13 about a man who graduated from Michigan Tech.

14 THE COURT: Unless you can lay a foundation that it
15 is more than fiction I will not allow.

16 MR. PORTIS: Well, it is.

17 THE COURT: I've ruled.

18 (Within hearing of the jury:)

19 Q (By Mr. Portis) These novels that you wrote, were
20 they novels, have anything to do with -- is any of the
21 background of the primary character similar to your life?

22 A No. The novels are 100 percent fiction.

23 Q Where did the primary person in these books, where
24 did he graduate from?

25 MR. BIBB: Objection, your Honor.

1 THE COURT: Sustained.

2 Q (By Mr. Portis) When you were asked about these
3 novels in your deposition initially, did you ask before you
4 answered anything about these novels to take a bathroom
5 break?

6 MR. BIBB: Objection, your Honor.

7 THE COURT: Sustained.

8 Q (By Mr. Portis) Of the engineers that you talked
9 with at Toyota, did you talk to Mr. Santucci?

10 A I have not spoken with Mr. Santucci.

11 Q Did you talk to Mr. Tinto?

12 A I have not spoken with Mr. Tinto.

13 Q Did you speak to Mr. Hagawara?

14 A I have not spoken with him.

15 Q Did you talk to Mr. Ishii?

16 A I may have read his deposition. I don't know if I
17 have spoken with him.

18 Q Did you know that State Farm complained in 2007 about
19 the large increase of UA claims that it was paying?

20 A I don't know the details of that.

21 Q Did you know about it?

22 A No. I don't remember hearing about State Farm's
23 complaints about that.

24 Q Did you read Mr. Lentz's testimony about the fact
25 that -- that Toyota needed to quit lying to NHTSA?

1 A I haven't read Mr. Lentz's testimony.

2 Q Did you read any testimony about Toyota needing to
3 stop hiding stuff?

4 A I cannot recall testimony that is not scientific that
5 is not engineering based.

6 Q Did you read any testimony about Toyota needing to
7 come clean on UA matters?

8 A Not that I can recall. No. I don't know what you're
9 referring to.

10 Q But yet you say this system is safe, right?

11 A That is my opinion, based on all the work I've done.
12 That's correct.

13 Q Now, you did read -- one more thing -- you did read
14 the testimony in this case, correct?

15 A Testimony of?

16 Q Of the witnesses in this case?

17 A Some of them. I'm not sure I have depositions for
18 everybody.

19 Q Well, you did a case summary in the case, right?

20 A That's correct. For those witness.

21 Q And you mentioned Ms. Katherine Western, right?

22 A Yes.

23 Q And you mentioned in your report that the passenger
24 Mrs. Schwarz kept telling her that the driver was not able
25 to stop the car, and they could not understand why it would

1 not stop. You knew that information, didn't you?

2 A That's what she testified to; that's correct.

3 Q She testified that the driver even pulled the
4 emergency brake; that's in your report, right?

5 A That is what that witness testified to. That's
6 correct.

7 Q You mentioned Mr. Allen in your report, correct?

8 A That's Milton Allen.

9 Q Yes.

10 A Yes, I did review his testimony.

11 Q And you understand that he was there and tried to
12 keep the -- Ms. Schwarz calm at the scene?

13 A That's correct. That is my understanding.

14 Q And what did Ms. Schwarz keep saying that what, what
15 would happen?

16 A It was something along the lines that the vehicle
17 wouldn't stop, things like that.

18 Q And you said in your record that Mrs. Schwarz said
19 she told the driver to pull the emergency brake but the car
20 would not stop?

21 A That is what they testified to. That's correct.

22 Q You mentioned Trooper Duerson, right?

23 A Yes.

24 Q And you mentioned the fact that he used a measuring
25 wheel to measure the skid marks on the exit ramp, correct?

1 A He did do that. Yes.

2 Q That that skid mark was from the braking of the
3 tires; is that right?

4 A That's correct.

5 Q And so you knew all of this, and you knew what was
6 going on in the real world that day, and you're coming in
7 here and you're testifying that this vehicle was safe on
8 this day; is that right?

9 A That's my belief, that is my opinion. Yes.

10 Q Did you review the testimony of Mr. Toyoda that he
11 gave to congress?

12 A I have not.

13 Q Did you review Mr. Lentz's testimony?

14 A I have not.

15 Q Did you review any of the other incidents, the
16 thousands of other incidents that have occurred involving
17 UA?

18 A I -- I look at things on a case-by-case basis, so I
19 don't do database analysis. I'm familiar with them, but I
20 haven't looked at the way that you word it so generally.
21 But in my thinking, I take these on a case-by-case basis.

22 Q Well, you do realize, don't you, that when this
23 electronic throttle control system was put in this Toyota
24 Camry there was a 400 percent increase in UAs; is that
25 right?

1 A You know, I've heard that number, and I think I
2 looked at some of that. But it is like my understanding is
3 it is not really comparing -- it is like comparing apples
4 and oranges. The data, as I understand it, was not at that
5 point drilled down. It was evaluated in a way where it
6 didn't get specific enough. I've heard the number 400
7 percent, but I think that is related to an investigation
8 NHTSA did on the -- on the early versions of this vehicle.
9 And I'm pretty sure eventually they did an investigation and
10 closed it.

11 Q You are not saying Mr. Lentz was untruthful to
12 congress, are you?

13 A I don't believe he was. There is no reason to
14 believe that he was.

15 MR. PORTIS: Thank you.

16 THE COURT: Any redirect, Mr. Bibb.

17 MR. BIBB: Just a little bit, your Honor. Thank
18 you.

19 REDIRECT EXAMINATION

20 BY MR. BIBB:

21 Q Dr. Livernois, just a very few things. First about
22 -- I think you admit it you're not a braking expert, are
23 you?

24 A I'm not.

25 Q And the tests that Mr. Portis referred to that had

1 been run by people, you were here for some of the testimony,
2 but -- I think of Dr. Arora, but you're also familiar with
3 some tests that Mr. Walker ran on the brakes, he was the
4 brake expert, wasn't he?

5 A That's correct.

6 Q And those tests were run at 30, 50, and I think Dr.
7 Arora at 60 pounds of force on the brake pedal; are you
8 aware of that?

9 A That's my recollection.

10 Q Of course, in those tests, some of the tests showed
11 two braking tire marks in the test, did they not?

12 A That's my recollection. Correct.

13 Q And depending on how hard you press on the brake
14 pedal, how much force you put on the brake pedal, that has a
15 relationship to how short a distance the car stops; is that
16 right?

17 A It does. It also depends on the road surface as
18 well.

19 Q Absolutely. A lot of factors to be taken into
20 account. But generally assuming the road surface everything
21 is being equal, the harder you press on the pedal the
22 shorter the distance?

23 A That's correct.

24 Q And I think Mr. Hannemann who was here was telling
25 the jury that, you know, it could have been that Ms. Bookout

1 was pressing with less than 23 pounds of force, that would
2 be the maximum that he could calculate.

3 MR. PORTIS: I object to leading.

4 MR. BIBB: I will withdraw that question.

5 Q (By Mr. Bibb) If you press with less force, the
6 distance goes up, all things being equal?

7 A That's correct.

8 Q Now, and you're not offering any opinion about how
9 hard Ms. Bookout pressed on the brake pedal?

10 A No, I'm not.

11 Q But based on your experience in the industry here and
12 your knowledge of how this crash happened, Dr. Livernois,
13 could this crash be produced by a combination of
14 acceleration and braking using the accelerator pedal and the
15 brake pedal?

16 MR. PORTIS: Your Honor, one, I object. No
17 foundation laid. He just said he couldn't testify about
18 that.

19 THE COURT: Lay a foundation.

20 MR. BIBB: Let me back up.

21 Q (By Mr. Bibb) You have investigated other accidents,
22 correct?

23 A I have.

24 Q You investigated this accident, right?

25 A That's correct.

1 Q And I'm not asking you about any details of the
2 braking system, but have you been to the scene of where this
3 accident happened?

4 A Yes, sir, I have.

5 Q You have seen the car in this case?

6 A Yes, I have.

7 Q You tested an exemplar vehicle?

8 A That's correct.

9 Q Could this wreck have occurred by application of a
10 brake pedal, a combination of a brake pedal and an
11 accelerator pedal?

12 MR. PORTIS: Objection, your Honor. This is beyond
13 anything we talked about or any of his opinions.

14 MR. BIBB: He covered a lot of stuff about braking.

15 THE COURT: I will overrule that objection.

16 Q (By Mr. Bibb) Do you want the question again?

17 A Yes, please.

18 Q Could this wreck have been produced by nearly the
19 combination of depressing the accelerator pedal and later
20 depressing brake pedal?

21 A Yes, it could have.

22 Q MISRA, do you know what MISRA is?

23 A I have an understanding of MISRA.

24 Q Is it a coding guideline?

25 A There is some guidelines that they provide that some

1 companies adhere to. Certainly it is not an industry
2 standard.

3 Q Is it a software coding guideline?

4 A It is. Yes.

5 Q Does it have anything to do with failsafes?

6 A Not generally.

7 Q You've mentioned that -- have you read the NASA and
8 NHTSA materials?

9 A I have.

10 Q Did they find anything, from the software standpoint,
11 that could cause unintended acceleration in vehicles?

12 A No. NHTSA has not found it, NASA has not. In fact,
13 nobody has.

14 Q And you're familiar with the testing that was done by
15 Mr. Barr and Mr. Loudin? Did they find something that could
16 cause an unwanted acceleration that is not mitigated by
17 failsafe?

18 A No. They even changed the code and they couldn't get
19 it to happen.

20 Q Last thing, Dr. Livernois. You mentioned -- or Mr.
21 Portis asked you about this so-called 400 percent increase.
22 Was that -- I think you recollected it had something to do
23 with a NHTSA investigation of some drivability issues in
24 Camrys?

25 A Yes.

1 Q And was that investigation ultimately closed?

2 A Yes, it was. That is my recollection.

3 MR. BIBB: May I approach, your Honor.

4 THE COURT: Yes.

5 Q (By Mr. Bibb) I will ask you to take a look at that
6 document, please. Are you familiar with that document?

7 A I believe I've seen it. Yes.

8 Q Is this the closing resume of that investigation,
9 so-called 400 percent increase?

10 A Yes. 2004. That's correct.

11 Q This was in early 2004 that the 400 percent increase
12 with -- what is the date of that?

13 A The date is -- date closed, it says July 22, 2004.

14 Q All right. And across the top of it, does it have --
15 not at the top, but it lists the number of units that they
16 were looking at. They were looking at not just -- what
17 model year vehicles were they looking at?

18 A They were looking at the Toyota Camrys model year
19 2002, 2003; the Solara and the Lexus in those model years.

20 Q How many vehicles were in that population?

21 A 982,108.

22 Q 982,108. How many complaints did NHTSA have?

23 A Says there is a total of 20.

24 Q Twenty complaints. They also had two, and I think
25 that may be included in that 20 of crashes, and 43 warranty,

1 43 warranty claims; is that right?

2 A Yes. It is a warranty claim, 43.

3 Q So a total of 63 out of a vehicle population of
4 982,108?

5 A That's right.

6 Q And if I do my math correctly, that works out to be
7 0064 percent population?

8 A That looks like about right. You better put a
9 percent sign at the end, because that is two more zeros.

10 MR. BIBB: Thank you, Judge. That's all I have.

11 THE COURT: Counsel, would you approach for just a
12 moment.

13 (Whereupon, an off-the-record discussion was had.)

14 THE COURT: Ladies and gentlemen, we will take our
15 morning break at this point in time. We're in recess for 15
16 minutes. I would remind you: During the recess, do not
17 discuss the case, and do not begin to form any opinions
18 about the case. All rise while the jury exits.

19 (Whereupon, a short recess was had.)

20 THE COURT: The court is going to admit into
21 evidence, over the defendants' objections, the redacted
22 copies of Plaintiffs' Exhibit No. 4803, 4878, 669, 682, 684,
23 and 688.

24 MR. CLARK: And that's all of them. I think Mr.
25 Teague may have one or two.

1 THE COURT: Okay.

2 MR. TEAGUE: Your Honor, this is the transcript of
3 Catrina Bourne.

4 THE COURT: Okay.

5 MR. TEAGUE: Earlier you handed us Defendants'
6 Exhibit 28.1, and said you didn't have a record of that.
7 That was offered during Ms. Brandt's testimony.

8 MR. JENNINGS: And admitted at that time.

9 THE COURT: Do you remember?

10 MR. TEAGUE: Then I think Mr. Walker and Mr.
11 Stopschinski's exhibits need to be admitted.

12 THE COURT: Right. What about the other -- this is
13 the other one that we talked about that you removed.

14 MR. ESDALE: Yes, ma'am. And I have reviewed
15 those, your Honor, we do not have any objections to those
16 two exhibits.

17 THE COURT: The court is admitting Defendants' 189
18 with the redactions that we discussed yesterday, and
19 Defendants' Exhibit 324.4.

20 (Whereupon, a brief recess was had.)

21 THE COURT: We're back on the record. Members of
22 the jury are present as well as counsel and their clients.

23 Mr. Bibb, you may call your next witness.

24 MR. BIBB: Thank you, your Honor. The defendants
25 rest.

1 THE COURT: Thank you. Plaintiffs, do you have any
2 additional?

3 MR. BEASLEY: Judge, we have no additional.

4 THE COURT: All right. Ladies and gentlemen, that
5 completes the presentation of the evidence in this case.
6 We're going to recess for the day. We're going to start
7 back up -- we have to get our jury instructions ironed out
8 and get everything ready up for jury instructions and
9 closing arguments tomorrow morning.

10 We will start tomorrow morning at 9. I am assuming
11 that it will take the entire morning for me to read the jury
12 instructions and give both sides an ample opportunity to
13 present their closing arguments. So the case will be
14 submitted for your determination just shortly after lunch
15 tomorrow if all goes according to plan.

16 Once you begin your deliberations -- and we're
17 going to have you instead of in my jury deliberation room --
18 our jury deliberation room is actually upstairs, so we will
19 clear the courtroom of everything and you will deliberate
20 here in the courtroom.

21 The other thing being once you begin your
22 deliberations, we will be taking your cell phones from you.
23 If you haven't obtained my office number, you might want to
24 do that before you leave today so if anyone needs to reach
25 you in the event of an emergency they can call my office and

1 we can contact you.

2 So I want to in advance tell you how much we all
3 appreciate. You have all been one of the most attentive
4 juries that I've had on my 11 years on the bench. So I
5 appreciate your attentiveness, and I know both counsel for
6 plaintiff and defendant would agree with that.

7 So we will in recess until tomorrow morning
8 promptly at 9:00. Have a good afternoon and a good evening.
9 we will see you tomorrow morning.

10 All rise while the jury exits.

11 (Conclusion of morning trial proceedings.)

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1 STATE OF OKLAHOMA)
2 COUNTY OF OKLAHOMA)

3
4 C-E-R-T-I-F-I-C-A-T-E
5

6 I, Karen Twyford, Certified Shorthand Reporter, in
7 and for the County of Oklahoma, State of Oklahoma, do hereby
8 certify that the foregoing transcript is a true, correct,
9 and complete transcript of my stenographic notes.

10 I further certify that I am not related to any of
11 the parties herein, nor am I interested in any way in the
12 outcome of these proceedings.

13 WITNESS my Hand this _____ day of _____,
14 2013.
15
16
17

18 _____
19 KAREN TWYFORD
20 CERTIFIED SHORTHAND REPORTER
21 CERTIFICATE NO. 01780
22
23
24
25

***** THIS TRANSCRIPT HAS NOT BEEN PROOFREAD *****